

REMARKS

Reconsideration and allowance of this application are respectfully requested. Currently, claims 9-10, 12-15, 19-28, 31-33 and 35-37 are pending in this application.

Allowable Subject Matter:

Applicant notes with appreciation the indication that claims 12-13 and 35-37 would be allowable if re-written in independent form. By this Amendment, claims 12 and 35 have been re-written in independent form. Claims 13 depends from claim 12, and claims 36-37 depend from claim 35. Claims 12-13 and 35-37 are thus allowable.

Rejections under 35 U.S.C. §103:

Claims 9-10, 26-29 and 31-33 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Tanisawa (U.S. '778), Gupta (U.S. '359) and Andrews (U.S. 531). Applicant traverses this rejection.

In order to establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. The three-way combination of Tanisawa (U.S. '778), Gupta (U.S. '359) and Andrews fails to teach or suggest all of the claim limitations. For example, the three-way combination fails to teach or suggest "wherein at least the optoelectronic device is provided with a spacing layer between the optical axis of the optoelectronic device and the bonding surface, additional to the optoelectronic device, which spacing layer provides the bonding surface for said flip chip mounting of the optoelectronic device, enables electrical contact to be made to the optoelectronic device, and determines the distance from the bonding surface to the optical axis of the optoelectronic device when mounted on the shared substrate, to achieve said optical coupling in use, said spacing layer comprising a glass material having both organic and inorganic components," as required by independent claim 9 and its dependents.

Claim 9 thus requires “a spacing layer between the optical axis of the optoelectronic device and the bonding surface, additional to the optoelectronic device, which spacing...determines the distance from the bonding surface to the optical axis of the optoelectronic device when mounted on the shared substrate (emphasis added).”

Section 4 (pages 2-3) of the Office Action alleges that Tanisawa’s layer 33 discloses the claimed spacing layer, Tanisawa’s optical element 31 discloses the claimed optical axis of the optical electronic device, and Tanisawa’s chip surface 5a discloses the claimed bonding surface. However, as can be plainly seen from Tanisawa’s Fig. 5 (e.g., see Fig. 5(A) reproduced below) for example, Tanisawa’s layer 33 (the alleged spacing layer as claimed) is not positioned between Tanisawa’s optical element 31 (the alleged optical axis of the optical electronic device as claimed) and Tanisawa’s chip surface 5a (the alleged bonding surface as claimed). Since Tanisawa’s layer 33 is not positioned between the optical element 31 and chip surface 5a, Tanisawa’s layer 33 also does not provide spacing which “determines the distance from the bonding surface to the optical axis of the optoelectronic device when mounted on the shared substrate” as explicitly required by claim 9. Again, Tanisawa’s layer 33 does not lie between the chip surface 5a and optical element 31, and therefore cannot, in any way, affect the distance of the chip surface 5a to the optical element 31.

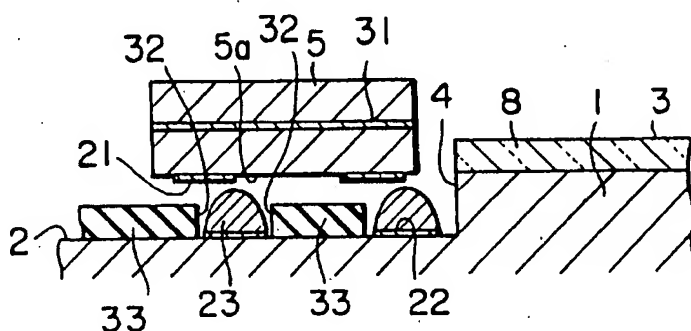


FIG. 5(A)

The above is true whether or not surface 5a is the bonding surface of the optoelectronic device in Figure 5 of Tanisawa. In fact, surface 5a is just the chip surface (see column 5, lines 8-9 of Tanisawa). The chip 5 is bonded by means of solder bumps 23 which bond to electrodes 21 of the device 5 (see column 3, lines 39-41 of Tanisawa). The bonding surface of the device 5 in practice is the exposed surface of the electrodes 21 in Figure 5 of Tanisawa. The spacing layer 33 does not lie between the electrodes 21 and the optical element 31 either.

Tanisawa's spacing layer 33 is thus on the "wrong" side of the bonding surface of the optoelectronic device used in the flip chip mounting. The spacing layer 33 does not provide the bonding surface of the optoelectronic device and it cannot determine "the distance from the bonding surface of the optoelectronic device to its optical axis" because it is the "wrong" side of the bonding surface of the device with respect to the optical axis of the device. Again, Tanisawa's layer 33 does not lie between the chip surface 5a and optical element 31. This is not an insignificant difference. Tanisawa's layer 33 is on the "wrong" side because it has been made in a known manner onto the shared substrate 1. It has not been added to an existing optoelectronic device prior to that device being flip chip mounted.

None of the cited art (including Gupta nor Andrews) resolves the above described deficiencies of Tanisawa. For example, none of cited art (including Gupta and Andrews) teaches or suggests a spacing layer that has been added to an existing optoelectronic device prior to flip chip mounting. Even if Tanisawa's device were to be grown on a substrate before being flip chip mounted, the alleged spacing layer 33 is still on the "wrong" side of the bonding surface (whether 5a or the electrodes 21) of the device with respect to the optical axis of the device, and therefore cannot possibly determine "the distance from the bonding surface to the optical axis of the optoelectronic device" as claimed.

Claims 14-15 have been rejected under 35 U.S.C. §103 as allegedly being unpatentable over the four-way combination of Tanisawa, Gupta and Andrews, and further in view of Blauvelt (U.S. '913). Claims 19-22, 24 and 25 have been rejected under 35 U.S.C. §103 as allegedly being unpatentable over the four-way combination of Tanisawa, Gupta and Andrews, and further in view of Nashimoto (U.S. '660). Claim 23 has been rejected under 35 U.S.C. §103 as allegedly being unpatentable over the five-way combination of Tanisawa, Gupta, Andrews and Nashimoto, and further in view of Kaneko. Claim 14-15 and 19-25 each depends directly or indirectly from base independent claim 9. None of the fourth or fifth references (Blauvelt Nashimoto and/or Kaneko) resolve the above described deficiencies of the combination of Tanisawa, Gupta, Andrews. Applicant thus requests that these additional rejections under 35 U.S.C. §103 be withdrawn.

Conclusion:

Applicant believes that this entire application is in condition for allowance and respectfully requests a notice to this effect. If the Examiner has any questions or believes that an interview would further prosecution of this application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

Raymond Y. Mah
Reg. No. 41,426

RYM:dmw
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100